



ELEVATOR MODERNIZATION



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WHAT SHOULD YOU KNOW ABOUT ELEVATOR MODERNIZATION?

Elevator modernization: you've probably heard of it. In fact, if you own or manage a property and are reading this guide, you probably know that you need to look into it. Is it as complicated as it sounds? Kind of, but this guide is meant to walk you through it.

First, we'll start with what we mean when referring to "elevator modernization." It is important to note that in Elevator Safety Code, there is no mention or use of the term "elevator modernization." Instead, the code refers to changes in elevators as "Alterations." However, the term **modernization** is widely used in the industry to encompass the process of making upgrades to key components of an elevator for the purpose of performance and/or safety improvements, handling new technology, better aesthetics or all of the above. This can range from simply changing the floor tile to re-skinning the inside of the cab so it looks modern, to changing the elevator controls, to completely overhauling or replacing almost every part of an existing elevator installation. As you can see, there is not one set path to go about doing this.

In most cases, modernization will affect one or more of the following:

- ✓ **HOIST MACHINES AND MOTORS**
- ✓ **ELECTRICAL WIRING AND CAB BUTTONS**
- ✓ **CONTROL EQUIPMENT**

As far as cosmetics go, the focus is usually on the elevator's interior cab. Items like door skins, floor/ceiling updates, wall paneling and other styling are altered.

WHAT SHOULD YOU KNOW ABOUT ELEVATOR MODERNIZATION?

WHY IS IT SO IMPORTANT?

As you're likely learning, projects like these are no small expense, as modernization costs can approach \$250,000 per unit ([FacilitiesNet](#)). While costs can greatly differ between the modernization of a two-stop hydraulic elevator and a high rise traction elevator, in any case, it is never a small budget item. In addition to being costly, elevator mods have very long term implications. It is not unusual for an elevator to go unaltered for twenty or more years, so choices made now can impact the functionality of the elevator for years.

For instance, a building built in 1980 might have been designed for offices and clerical desks and occupancy of 50 people per floor. Today, several of the floors may be call centers with 150 people per floor in cubes. Serving this higher occupancy requires more elevator runs than originally designed. The equipment must be designed to perform at that level or down-time will be high. Another change in use might be that the building has multi-floor tenants. The need to travel between floors by employees of this tenant results in demand for more runs. Again, failing to factor this into a modernization can prove problematic. In the event of an elevator modernization, it is important to plan based on multiple possible future scenarios.

The bottom line here is **poor elevator performance not only causes safety issues, but it also causes unhappy tenants**. People don't want to stand around waiting for an elevator or fear getting stuck every time they get on it. Use your elevator modernization as an opportunity to improve your elevator's performance in a significant way and increase the likelihood of your [tenant retention](#).

WHEN SHOULD YOU MODERNIZE?

In general, a widely accepted best practice is to modernize your elevators every twenty years or so. Logically, older elevators lack safety and performance control systems found in modern elevators. For instance, most elevators built before 1980 are missing imperative safety systems including but not limited to redundancy circuits, fire service systems and lock monitoring capability. However, **elevator maintenance should not be measured by time, but instead by usage and performance.** Some elevators begin performing poorly well before the twenty year mark. You should conduct regular performance checks on your elevators to evaluate what kind of shape they are in and the need for modernization. As a guide of what to be looking for, National Elevator Industries Inc. (NEII) offers a [free checklist](#) (page 6-5) for your reference.

Performance metrics that should be observed over time include: travel time between floors, door closing times, vibration and ride quality, response times and noise levels. [Keeping record of service calls](#) over a year period can also prove useful when determining whether an increase in calls is circumstantial or a shortcoming of the elevator system, as an increase in service calls is a telling indicator that it may be time to modernize.

NOTE:

Performance metrics should be measured separately for each elevator.

WHEN SHOULD YOU MODERNIZE?

In addition to increased service calls and tenant complaints, other signs that your elevator might require modernization include:

- ✓ **Your elevator has caused any accidents and/or has the potential to cause accidents.**
- ✓ **You are paying extra fees for trouble calls after business hours.**
- ✓ **Your elevator is not ADA/ASME/IBC compliant.**
- ✓ **Newer equipment has safety features that your elevator does not have.**
- ✓ **Sourcing replacement parts is becoming much harder as supplies dry up and manufacturers stop producing spare parts.**
- ✓ **The retirement of service mechanics results in loss of the knowledge to keep your old elevators in service.**
- ✓ **Your elevator is past the age of elevator companies being able to put it under a full maintenance contract.**

Just **ONE** accident could cost much more than the upgrade that could have prevented it.

WHEN SHOULD YOU MODERNIZE?

You must always keep your business and competitors in mind as well. How do your elevators compare to those in competitive buildings nearby? As Marc Cerniglia, president of elevator consultant Ascent, says, “The decision to modernize is more of a business decision than a technical one. Clearly, today’s technology is better than yesterday’s. For most owners, the decision is strictly a financial one. **Does it add value and how much?**” ([Buildings](#)). John Moran, senior vice president of Syska Hennessy Group, elaborates on how modernization can become a business decision. “In Class A buildings, we see a lot of owners take the initiative on a competitive basis.” ([FacilitiesNet](#)). As he points out, because of high demand coming from tenants themselves, building managers must remain competitive and comparable to the rest of their market.



BENEFITS OF MODERNIZATION

As implied in the previous section, many property managers choose to modernize because of the unacceptable state of their current elevator system. While the actual elevator problems can vary from building to building, the overall scope and magnitude of an elevator modernization allows the building owner to enjoy multiple benefits as an outcome. Below are some common improvements brought about by the process.

RELIABILITY

By updating your elevator, and in many cases doing so after unsteady maintenance throughout the years, an obvious benefit you will readily notice is your elevator's improved reliability. If your elevator was previously implementing mechanical relays and contacts, simply replacing these with modern, solid-state electronics will provide worlds of improvement and much more reliable performance.

DISPATCHING IMPROVEMENTS

Additional advanced electronics can be implemented to decrease wait times by improving the dispatch system's effectiveness. Furthermore, improvements enable the dispatch electronic system to recognize "coincidental trips." This means there will be fewer instances of sending an elevator car to an empty floor after someone has already gotten into an elevator that was dropping someone else off, resulting in a higher level of cab availability through more efficient dispatching.

RIDE QUALITY

The elevator's acceleration and deceleration can be vastly improved by implementing [Variable-Voltage, Variable Frequency \(VVVF\)](#) drives in place of motor-generator based drive designs. This will create both a quicker and smoother ride for elevator occupants.

BENEFITS OF MODERNIZATION

SAFETY

As previously mentioned, safety is a huge concern when modernizing your elevator and complying to code. Your passengers' safety is improved through system and equipment upgrades. Some examples of this include the implementation of a double brake system and an unintended car movement protection device.

ENERGY EFFICIENCY

Energy efficiency is a perennially hot topic in property management. Older elevators waste a lot of energy, which is released as heat into the machine room. Removing this waste heat is a large contributor to elevator operating costs. Fully modernized elevator systems can recapture this waste heat and feed the energy back into the building upon descension. While it is difficult to measure an elevator's overall contribution to a building's energy savings, elevator modernization is thought to be able to save elevator energy costs up to 40-60%. Specific modernizations to look at that cut both energy and costs include implementation of smart controllers, motor drive replacement and DC motor replacement.



THE MODERNIZATION PROCESS

Once you decide that an elevator modernization is in order, you will need to develop an **initial modernization plan**, typically with the help of your elevator service company, an elevator consultant or whoever will be performing the modernization. The plan should cover the entire scope of the modernization: all parts of the elevator that you are looking to modernize, the amount of time that it will take, all costs associated and factoring in code compliance to ensure all needs are met there. In order to do so, you will want to do the appropriate research to determine all applicable regulations and building permits that affect you.

Additionally, you should be on the lookout for **available subsidies**, as there are [several local and national programs](#) that will provide subsidies and/or tax credits to those who modernize for the purpose of improving safety or energy efficiency.

When it comes to budgeting for elevator modernization, not all property managers realize that there is a high probability that more will be involved with the project than just modernizing the elevator system itself, especially in high-rise buildings. Thomas Durels, executive vice president and chief of property operations and leasing for Empire State Realty Trust, points out, “It’s a complicated process that also encompasses **HVAC, electrical, and fire and life safety systems.**” ([High Rise Facilities](#)). This is why it is extremely important to factor in all related building costs into your modernization budget. Developing this comprehensive plan ahead of time, especially taking the time to factor in all code requirements, will significantly reduce the chances of running into surprises or unexpected costs once the modernization begins.

THE MODERNIZATION PROCESS

See these tables for various components that may need to be replaced based on your particular modernization plan:

ELEVATOR CAB

COMPONENT	SCHEME OF ELEVATOR MODERNIZATION PLAN			
	REFURBISHMENT WORK	PARTIAL MODERNIZATION	FULL MODERNIZATION	FULL REPLACEMENT
SLING	NO	NO	OWNER DISCRETION	YES
DOOR OPERATOR	NO	OWNER DISCRETION	YES	YES
CAB DESIGN	OWNER DISCRETION	OWNER DISCRETION	YES	YES
CAB DOORS	OWNER DISCRETION	OWNER DISCRETION	YES	YES
CAB FIXTURES	YES	OWNER DISCRETION	YES	YES
WEDGES CONNECTED TO GOVERNOR	NO	NO	YES	YES
ADDITIONAL PHONE/ INTERCOM IF NOT EQUIPPED	OWNER DISCRETION	YES	YES	YES
TRAVELING CABLE	NO	YES	YES	YES
HYDRAULIC RAMS	NO	NO	NO	YES
WIRE ROPES	NO	OWNER DISCRETION	YES	YES

(Source: [Elevatorpedia](#))

THE MODERNIZATION PROCESS

SHAFT

COMPONENT	SCHEME OF ELEVATOR MODERNIZATION PLAN			
	REFURBISHMENT WORK	PARTIAL MODERNIZATION	FULL MODERNIZATION	FULL REPLACEMENT
COUNTERWEIGHT	NO	NO	NO	YES
GUIDE RAILS	NO	NO	NO	YES
BUFFERS	NO	NO	YES	YES
ELECTRICAL COMPONENTS	NO	NO	NO	YES
TAPEHEAD	NO	YES	YES	YES
LIMIT SWITCHES	NO	YES	YES	YES
WIRING	NO	YES	YES	YES
COMPENSATIONS	NO	NO	NO	YES

(Source: [Elevatorpedia](#))

THE MODERNIZATION PROCESS

LOBBY

COMPONENT	SCHEME OF ELEVATOR MODERNIZATION PLAN			
	REFURBISHMENT WORK	PARTIAL MODERNIZATION	FULL MODERNIZATION	FULL REPLACEMENT
SHAFT DOOR COMPONENTS	OWNER DISCRETION	OWNER DISCRETION	YES	YES
SHAFT DOORS	OWNER DISCRETION	OWNER DISCRETION	OWNER DISCRETION	YES
HALL FIXTURES	YES	OWNER DISCRETION	YES	YES

MACHINE ROOM

COMPONENT	SCHEME OF ELEVATOR MODERNIZATION PLAN			
	REFURBISHMENT WORK	PARTIAL MODERNIZATION	FULL MODERNIZATION	FULL REPLACEMENT
MACHINES	NO	OWNER DISCRETION	YES	YES
CONTROLLERS	NO	YES	YES	YES
REMOVAL OF THE SELECTOR	OWNER DISCRETION	YES	YES	YES
OVERSPEED GOVERNOR	NO	NO	YES	YES
UNINTENDED CAR MOVEMENT PROTECTION DEVICE	OWNER DISCRETION	BY ELEVATOR SAFETY CODE		
BACKUP BATTERY/ UPS SYSTEM	NO	YES	YES	YES

(Source: [Elevatorpedia](#))

THE MODERNIZATION PROCESS

Finally, building owners must account for their elevators being out of commission during the elevator modernization process by implementing a plan for redirecting elevator users to the in-service elevators. You will want to make sure that all tenants and residents are aware that the condition is only temporary and adhere to their needs in the meantime in a way that is satisfactory to them.



ABOUT US: KINGS III AND ELEVATOR MODERNIZATION

WHO IS KINGS III?

As a family owned company, we have built our business around delivering peace of mind to our customers by helping them reduce their risk exposure. Our turnkey emergency communication services are utilized in elevators, pools, parking garages, campuses and more. The heart of our business is our very own state-of-the-art Emergency Dispatch Center (EDC). The EDC is always on call 24/7/365 with a redundant dispatch center. It is also differentiated by the advanced training required of our operator teams. Our full-service package includes equipment, installation, maintenance, monitoring and dispatch services bundled in a convenient and hassle-free solution for our clients. To learn more, visit www.kingsiii.com.

HOW CAN WE HELP DURING MODERNIZATION?

As a Kings III customer undergoing the elevator modernization process, you don't need to buy elevator phones in your modernization bid. Kings III will supply new and compatible phones to your elevator installer at no charge. This takes a little bit of the financial load off of you and allows the continuity of Kings III's emergency phone monitoring at your location.

**WANT US TO TAKE ELEVATOR EMERGENCY COMMUNICATIONS
OFF YOUR PLATE?**

Fill out [this form](#) and your local Kings III Business Development Manager will contact you shortly.

SOURCES/ RESOURCES

SOURCES:

- ✓ [Buildings](#)
- ✓ [Delta](#)
- ✓ [Elevatorpedia](#)
- ✓ [FacilitiesNet](#)
- ✓ [High Rise Facilities](#)
- ✓ [Kone](#)
- ✓ [Liberty Elevator](#)
- ✓ [National Elevator Industries Inc.](#)
- ✓ [Stanley](#)

ADDITIONAL KINGS III RESOURCES:

- ✓ [Understanding Elevator Emergency Communication Code](#)
- ✓ [Pool Maintenance and Safety](#)
- ✓ [Energy Efficiency for Commercial Buildings](#)
- ✓ [The ABC's of Property Management pt. 1](#)
- ✓ [The ABC's of Property Management pt. 2](#)
- ✓ [Building Your Emergency Action Plan](#)
- ✓ [The Americans with Disabilities Act Guide for Property Managers](#)
- ✓ [Top Five Ways for Property Managers to Cut Costs](#)

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